



# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

## TRIMESTER 2, 2015/2016

# **BFN 1814 – FINANCIAL MANAGEMENT (DISTANCE EDUCATION)**

4<sup>th</sup> MARCH 2016  
(9.00 a.m – 11.00 a.m)  
(2 Hours)

## INSTRUCTIONS TO STUDENT

1. This Questions paper consists of six (6) pages with 2 sections *excluding* the cover page, formula and financial tables.
2. **Section A – 20 Multiple Choice Questions (30 marks)**  
Instruction: Answer **ALL** questions. Shade your answer in the OMR sheet provided.
3. **Section B – 4 Working Problems (70 Marks)**  
Instruction: Answer **ALL** questions. Write your answers in the Answer Booklet provided.

**Section A – MULTIPLE CHOICES (30 marks)**

There are 20 questions in this section. Answer all questions on the multiple choice answer sheet (1.5 marks each).

1. Zaenm deposited RM1,000 in a savings account that pays 8 percent interest, compounded quarterly, planning to use it to finish his last year in MMU. Eighteen months later, Zaenm decide to go to Sipadan Islam to become a scuba diver instructor rather than continue in school, so he closes out his account. How much money will Zaenm receive?
  - a. RM1,126
  - b. RM1,171
  - c. RM1,082
  - d. RM1,163
2. An annuity with an infinite life is called a(n)
  - a. perpetuity.
  - b. primia.
  - c. indefinite.
  - d. deep discount
3. Sue was evaluating an investment opportunity with equal end of period cash flows, when she realized she would need a 10% return rather than an 8% return. Since the equal expected cash flows did not change, Sue should:
  - a. pay the same amount in present dollars for the investment
  - b. make certain the investment is not an annuity due
  - c. pay less in present dollars for the investment
  - d. try to increase the length of time she will hold the investment
4. A firm has RM5,000,000 of inventory on average and annual sales of RM30,000,000. Assume there are 365 days per year. What is the firm's inventory conversion period?
  - a. 30.25 days
  - b. 60.83 days
  - c. 45.00 days
  - d. 72.44 days
5. A firm has a cash conversion cycle of 80 days, an average collection period of 25 days, and an average age of inventory of 70 days. Its operating cycle is \_\_\_\_\_ days.
  - a. 95
  - b. 105
  - c. 60
  - d. 130

**Continued...**

6. The firm's target capital structure is consistent with which of the following?
  - a. Maximum earnings per share (EPS).
  - b. Minimum cost of debt ( $k_d$ ).
  - c. Minimum cost of equity ( $k_s$ ).
  - d. Minimum weighted average cost of capital (WACC).
7. When using IRR, NPV, or PI in capital budgeting:
  - a. mutually exclusive projects are always ranked the same
  - b. the time value of money is taken into account
  - c. direct estimates of the increase or decrease in shareholder value can be obtained
  - d. accounting measures of profit are considered
8. According to the CAPM, the lower a security's beta, the \_\_\_\_\_ its exposure to systematic risk and the \_\_\_\_\_ its expected return.
  - a. greater; lower
  - b. greater; higher
  - c. lower; lower
  - d. lower; higher
9. Beta is a statistical measure of:
  - a. hyperbolic.
  - b. total risk.
  - c. the standard deviation.
  - d. the relationship between an investment's returns and the market return
10. Changes in the general economy, such as changes in interest rates or tax laws, represent what type of risk?
  - a. Firm-specific risk
  - b. Market risk
  - c. Unsystematic risk
  - d. Diversifiable risk
11. 1/15 net 30 date of invoice translates as
  - a. a 1 percent cash discount may be taken if paid in 15 days; if no cash discount is taken, the balance is due in 30 days after the middle of the month.
  - b. a 1 percent cash discount may be taken if paid in 15 days; if no cash discount is taken, the balance is due 30 days after the invoice date.
  - c. a 1 percent cash discount may be taken if paid in 15 days; if no cash discount is taken, the balance is due 30 days after the end of the month.
  - d. a 1 percent discount may be taken on 15 percent of the purchase if the account is paid within 30 days after the end of the month.

Continued...

12. For capital budgeting purposes, financial analysts focus on \_\_\_\_\_ inflows and outflows.

- Total cash
- working capital
- incremental cash
- working capital

13. Which of the following is not an advantage of both NPV and IRR?

- incorporates all cash flows that a project generates over its life
- makes an appropriate adjustment for the time value of money
- makes adjustments for differences in risk across projects
- will lead to the correct decision when a project's cash flows alternate between negative and positive values

14. All else equal, the future value of a lump-sum amount invested today will increase if the

- interest rate that is earned is lowered.
- investment time period is shortened.
- amount initially invested is lowered.
- number of compounding periods is increased

15. What is the composition of the nominal rate of interest?

- the real rate plus an inflationary expectation.
- the real rate plus a risk premium.
- the risk-free rate plus an inflationary expectation.
- the risk-free rate plus a risk premium.

16. The \_\_\_\_\_ is the rate of return a firm must earn on its investments in projects in order to maintain the market value of its stock.

- net present value
- cost of capital
- internal rate of return
- gross profit margin

17. James plans to fund his individual retirement account, beginning today, with 20 annual deposits of RM2,000, which he will continue for the next 20 years. If he can earn an annual compound rate of 8 percent on his deposits, the amount in the account upon retirement will be \_\_\_\_\_.

- RM19,636
- RM91,524
- RM98,846
- RM21,207

Continued...

18. \_\_\_\_\_ projects have the same function; the acceptance of one \_\_\_\_\_ the others from consideration.

- Capital; eliminates
- Independent; does not eliminate
- Replacement; does not eliminate
- Mutually exclusive; eliminates

19. A firm has a beta of 1.2. The market return equals 14 percent and the risk-free rate of return equals 6 percent. The estimated cost of common stock equity is

- 6 percent.
- 7.2 percent.
- 15.6 percent.
- 17.2 percent

20. A firm purchased goods with a purchase price of RM1,000 and credit terms of 1/10 net 30. The firm paid for these goods on the 5th day after the date of sale. The firm must pay \_\_\_\_\_ for the goods.

- RM990
- RM900
- RM1,000
- RM1,100

**Section 2 – SHORT ESSAY QUESTIONS. Answer all questions from this part.**

**QUESTION 1**

a. A financial analyst covering Magnum Oil has determined the following four possible returns given four different states of the economy over the next period.

Probability	Return
0.10	-0.20
0.25	-0.05
0.40	0.15
0.25	0.30

Based on the above information, calculate the following:

- expected return for Magnum Oil. (5 marks)
- variance for Magnum Oil. (5 marks)
- standard deviation for Magnum Oil. (5 marks)

**Continued...**

b. JayJay is a portfolio manager for a large pension fund. Last year his portfolio had an actual return of 12.6% with a standard deviation of 13% and a beta of 1.3. The market risk premium for this period of time was 6% and the risk-free rate of return was 5%.

Based on the Capital Asset Pricing Model (CAPM), what is the required rate of return for this portfolio? (5 marks)

(TOTAL: 20 Marks)

## QUESTION 2

BBC Berhad is interested in calculating the cost of capital. In order to calculate the cost of capital, the company has collected the following information:

- The company's capital structure consists of 40% debt and 60% common stock.
- The company has bonds outstanding with 25 years to maturity. The bonds have a 12 percent annual coupon, a face value of RM1,000, and a current price of RM1,000.
- The company uses the CAPM to calculate the cost of common stock. Currently, the risk-free rate is 5 percent and the market risk premium equals 6 percent. The company's common stock has a beta of 1.6.
- The company's tax rate is 40 percent.

Based on the above information,

- i. What is the company's after-tax cost of debt? (7 marks)
- ii. What is the company's cost of common equity? (6 marks)
- iii. Calculate the company's weighted average cost of capital (WACC)? (7 marks)

(TOTAL: 20 Marks)

## QUESTION 3

Romanelli Manufacturing is spending RM 115,000 to update its equipment. This is necessary if the firm wishes to be competitive in the marketplace and provide a wide array of product models. The company estimates that these updates will improve its cash inflows by RM 27,500 a year for eight years. The company requires a 14 percent return on the investment.

Continued...

Based on the above information,

- i. What is the payback period? (4 marks)
- ii. What is the Net Present Value (NPV)? (4 marks)
- iii. What is the Profitability Index (PI)? (4 marks)
- iv. What recommendation would you make relative to implementation of the project? Why? (3 marks)

**(TOTAL: 15 Marks)**

#### QUESTION 4

- a. Tamminga Corporation uses 360 units of an inventory item each year. The inventory order cost is RM100 per order and carrying costs are RM1 per item per year. Tamminga wishes to maintain a safety stock of 10 days of inventory and it takes the company 5 days to receive an order once it is placed. Assume a 365-day year. Calculate the economic order quantity for Tamminga's inventory item. (6 marks)
- b. Joyah Grocery Store ordered goods totalling RM3,000 every 3 months. The credit term set by the supplier is 2/10 net 30. If it takes the discount offered by the supplier, calculate the savings that can be obtained in a year. Assume that there are 360 days in a year. (4 marks)
- c. TinaTini is 30 years old and is saving for her retirement. She is planning on making 36 contributions to her retirement account of the next 36 years. The first contribution will be made today ( $t = 0$ ) and the final contribution will be made 35 years from today. The retirement account will earn a return of 10 percent a year. If each contribution she makes is RM3,000, how much will be in the retirement account 35 years from now? (5 marks)

**(TOTAL: 15 Marks)**

**End of Page**

## BFN1814 FINANCIAL MANAGEMENT

### Selected Formulas

$$1. \quad NPV = \sum_{t=0}^n \frac{CF_t}{(1+r)^t} - Co$$

$$2. \quad E(R) = \sum_{i=1}^n r_i P_i$$

$$3. \quad \sigma^2 = \sum_{j=1}^n (r_j - \bar{r})^2 \times P_{r_j}$$

$$4. \quad WACC = (w_i r_i) + (w_p r_p) + (w_s r_s)$$

$$5. \quad r_d = \frac{\frac{\$1000 - N_d}{n}}{\frac{N_d + \$1000}{2}}$$

$$6. \quad OC = AAI + ACP$$

$$7. \quad CCC = OC - APP$$

$$8. \quad EOQ = \sqrt{\frac{2 \times S \times O}{C}}$$

$$9. \quad DOL = \frac{Q(P-VC)}{[Q(P-VC)]-FC}$$

$$10. \quad DFL = \frac{EBIT}{EBIT - I - (PD \times 1/(1-T))}$$

Present Value and Future Value Tables

Table A-1 Future Value Interest Factors for One Dollar Compounded at  $k$  Percent for  $n$  Periods:  $FVIF_{k,n} = (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1200	1.1300	1.1400	1.1500	1.1600	1.2000	1.2400	1.2500	1.3000	
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225	1.3456	1.4400	1.5376	1.5625	1.6900
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3316	1.3676	1.4049	1.4429	1.4815	1.5209	1.5609	1.7280	1.9066	1.9531	2.1970
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3685	1.4116	1.4641	1.5181	1.5735	1.6305	1.6890	1.7490	1.8106	2.0735	2.3642	2.4414	2.8561
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5388	1.6105	1.6851	1.7623	1.8424	1.9254	2.0114	2.1003	2.4883	2.9316	3.0518	3.7129
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738	2.0820	2.1950	2.3131	2.4364	2.9060	3.6352	3.8147	4.8268
7	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107	2.3526	2.5023	2.6600	2.8262	3.5832	4.5077	4.7684	6.2749
8	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.7102	1.8509	1.9926	2.1436	2.3045	2.4760	2.6584	2.8526	3.0590	3.2784	4.2998	5.5895	5.9505	8.1573
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579	2.5580	2.7731	3.0040	3.2519	3.5179	3.8030	5.1598	6.9310	7.4506	10.804
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1589	2.3674	2.5937	2.8394	3.1058	3.3946	3.7072	4.0456	4.4114	6.1917	8.5944	9.3132	13.788
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785	3.8359	4.2262	4.6524	5.1173	7.4301	10.857	11.642	17.922
12	1.1268	1.2682	1.4258	1.6010	1.7955	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8960	4.3345	4.8179	5.3503	5.9380	8.9161	13.215	14.552	23.298
13	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.4098	2.7196	3.0588	3.4523	3.8833	4.3635	4.8980	5.4924	6.1528	6.8858	10.699	16.386	18.190	30.288
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871	5.5348	6.2613	7.0757	7.9875	12.839	20.319	22.737	39.374
15	1.1610	1.3459	1.5580	1.8009	2.0788	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4735	6.2543	7.1379	8.1371	9.2655	15.407	25.196	28.422	51.186
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.109	6.1304	7.0673	8.1372	9.3576	10.748	16.488	31.243	35.527	66.542
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660	7.9861	9.2765	10.761	12.468	22.186	38.741	44.409	86.504
18	1.1951	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9960	4.7171	5.5599	6.5436	7.5900	9.0243	10.575	12.375	14.463	26.623	48.039	55.511	112.455
19	1.2061	1.4568	1.7535	2.1088	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128	10.197	12.056	14.232	16.777	31.948	59.568	65.389	146.192
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.8044	6.7275	8.0623	9.6463	11.523	13.743	16.367	19.461	38.338	73.864	86.736	190.050
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0338	6.1088	7.4002	8.9492	10.804	13.021	15.668	18.822	22.574	46.005	91.592	108.420	247.065
22	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	4.4304	5.4365	6.5686	8.1403	9.9336	12.100	14.714	17.861	21.645	26.186	55.208	113.574	135.525	321.184
23	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9543	11.026	13.552	16.627	20.352	24.891	30.378	66.247	140.831	169.407	417.533
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497	12.239	15.179	18.788	23.212	26.625	35.238	79.497	174.631	211.758	542.801
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2918	5.4274	6.8485	8.6231	10.835	13.585	17.000	21.231	26.462	32.919	40.874	95.395	216.542	264.698	705.641
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7435	7.6123	10.063	13.268	17.448	22.892	29.960	39.116	50.950	66.212	85.850	237.376	634.820	807.784	-
35	1.4166	1.9999	2.8139	3.9461	5.5160	7.6861	10.677	14.785	20.414	28.102	38.575	52.800	72.069	98.100	133.176	180.314	590.668	-	-	-
36	1.4308	2.0398	2.8993	4.1039	5.7918	8.1473	11.424	15.968	22.251	30.913	42.818	59.136	81.437	111.834	153.152	209.164	708.802	-	-	-
40	1.4889	2.0280	3.2626	4.8010	7.0400	10.286	14.974	21.725	31.409	45.259	65.001	93.051	132.782	188.884	267.864	378.721	-	-	-	-
50	1.6446	2.6916	4.3839	7.1067	11.467	18.420	29.457	46.902	74.358	117.391	184.565	289.002	450.736	700.233	-	-	-	-	-	-

Table A-2 Future Value Interest Factors for a One-Dollar Annuity Compounded at  $k$  Percent for  $n$  Periods:  $FVIFA_{k,n} = [(1 + k)^n - 1] / k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	1.0000	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1200	1.1300	1.1400	1.1500	1.1600	1.2000	1.2400	1.2500	1.3000	
2	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0700	2.0800	2.0900	2.1000	2.1100	2.1200	2.1300	2.1400	2.1500	2.1600	2.2000	2.2400	2.2500	2.3000
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744	3.4069	3.4396	3.4725	3.5056	3.6400	3.7776	3.8125	3.9900
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7097	4.7793	4.8498	4.9211	4.9934	5.0655	5.3680	5.6842	5.7556	6.1870
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8866	5.9847	6.1051	6.2278	6.3528	6.4803	6.6101	6.7424	6.8771	7.4416	8.0484	8.2070	9.0431
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9763	7.1533	7.3359	7.5233	7.7156	7.9129	8.1152	8.3227	8.5355	8.7537	8.9775	9.3299	10.980	11.259	12.756
7	7.2136	7.4243	7.6625	7.8983	8.1420	8.3936	8.6540	8.9228	9.2004	9.4872	9.7833	10.089	10.405	10.730	11.067	11.414	12.916	14.615	15.073	17.583
8	8.2857	8.5630	8.8923	9.2142	9.5491	9.8975	10.260	10.637	11.028	11.436	11.859	12.300	12.757	13.233	13.727	14.240	16.499	19.123	19.842	23.858
9	9.3685	9.7546	10.1589	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164	14.776	15.416	16.085	16.765	17.519	20.799	24.712	25.802	32.015
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420	19.337	20.304	21.321	26.859	31.643	33.253	42.619
11	11.567	12.168	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561	20.655	21.814	23.045	24.345	25.733	32.150	40.238	42.566	56.405
12	12.663	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713	24.133	25.650	27.271	29.002	30.860	39.581	50.895	54.208	74.327
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985	32.089	34.352	36.786	48.497	64.110	68.760	97.625
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.0											

Present Value and Future Value Tables

Table A-3 Present Value Interest Factors for One Dollar Discounted at  $k$  Percent for  $n$  Periods:  $PVIF_{k,n} = 1 / (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8900	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6944	0.6504	0.6404	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8396	0.8163	0.7938	0.7722	0.7513	0.7312	0.7118	0.6931	0.6750	0.6575	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5346	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7659	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4666	0.4339	0.4039	0.3762	0.3508	0.3269	0.3050	0.2326	0.1783	0.1678	0.1226
9	0.9143	0.8356	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3606	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6138	0.5584	0.5083	0.4632	0.4224	0.3855	0.3522	0.3220	0.2946	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4751	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4440	0.3971	0.3555	0.3216	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.8810	0.6006	0.5303	0.4688	0.4150	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.5419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1599	0.1401	0.1229	0.1079	0.0549	0.0397	0.0352	0.0195
16	0.8528	0.7284	0.6232	0.5339	0.4681	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2592	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1424	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053	
21	0.8114	0.6598	0.5375	0.4388	0.3689	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0161	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4097	0.3266	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3801	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0421	0.0349	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0161	0.0116	0.0042	0.0016	0.0012	
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	0	
36	0.6989	0.4902	0.3458	0.2437	0.1727	0.1227	0.0875	0.0626	0.0449	0.0323	0.0234	0.0169	0.0123	0.0089	0.0065	0.0048	0.0014	0	0	
40	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	0	0	
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	0	0	0	

Table A-4 Present Value Interest Factors for a One-Dollar Annuity Discounted at  $k$  Percent for  $n$  Periods:  $PVIFA = [1 - 1/(1+k)^n] / k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9616	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9416	1.9135	1.8861	1.8534	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4558	1.4400	1.3609		
3	2.8410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869	2.4437	2.4018	2.3612	2.3216	2.2832	2.2459	2.1065	1.9813	1.9520	1.8161
4	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3872	3.3121	3.2397	3.1699	3.1024	3.0373	2.9745	2.9137	2.8550	2.7982	2.5887	2.4043	2.3616	2.1862
5	4.8534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908	3.6955	3.6048	3.5172	3.4331	3.3522	3.2743	2.9906	2.7454	2.6093	2.4356
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553	4.2305	4.1114	3.9975	3.8887	3.7845	3.6847	3.3255	3.0205	2.9514	2.6427
7	6.7282	6.4720	6.2303	6.0021	5.7864	5.5824	5.3883	5.2064	5.0330	4.8604	4.7122	4.5638	4.4226	4.2883	4.1504	4.0366	3.6045	3.2423	3.1611	2.8021
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9713	5.7465	5.5348	5.3149	5.1461	4.9676	4.7988	4.6389	4.4873	4.3435	3.8727	3.4212	3.2289	2.9247
9	8.5860	8.1622	7.7861	7.4593	7.1078	6.8017	6.5152	6.2489	5.9592	5.7590	5.5370	5.3282	5.1317	4.9464	4.7716	4.6055	4.0310	3.5655	3.4631	3.0190
10	9.4713	8.9828	8.5302	8.1108	7.7217	7.3601	7.0236	6.7101	6.4177	6.1445	5.8592	5.6502	5.4262	5.2161	5.0188	4.8332	4.1925	3.8189	3.5705	3.0915
11	10.368	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8052	6.4951	6.2055	5.9377	5.6869	5.4527	5.2337	5.0286	4.3271	3.7757	3.6564	3.1473
12	11.256	10.575	9.3540	8.9351	8.6333	8.3838	7.9427	7.5361	7.1607	6.8137	6.4924	6.1944	5.9176	5.6603	5.4206	5.1971	4.4392	3.8514	3.7251	3.1903
13	12.134	11.348	10.635	9.9856	9.3936	8.8527	8.3577	7.9038	7.4859	7.1034	6.7499	6.4235	6.1218	5.8424	5.5831	5.3423	5.4327	3.9124	3.7801	3.2233
14	13.004	12.108	11.295	10.563	9.8986	9.2950	8.7455	8.244												